



Commonwealth of Massachusetts
Executive Office of Energy & Environmental Affairs

Department of Environmental Protection

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June 29, 2017

Mr. Lon Bartoli
Lifoam Industries, LLC
351 Holt Road
North Andover, MA 01845

RE: NORTH ANDOVER
Transmittal No.: X273896
Application No.: NE-17-002
Class: *SM80-7*
FMF No.: 581820
AIR QUALITY PLAN APPROVAL

Dear Mr. Bartoli:

The Massachusetts Department of Environmental Protection ("MassDEP"), Bureau of Air and Waste, has reviewed your Non-major Comprehensive Plan Application ("Application") listed above. This application concerns the proposed installation and operation of fourteen new molding machines, a new pre-expander, and a new bead storage room which will all be controlled with a regenerative thermal oxidizer (RTO) at your new facility located at 351 Holt Road in North Andover, Massachusetts ("Facility"). The submitted application bears the seal and signature of Ms. Stacy Lynn Braga, Massachusetts P.E. No. 52938.

This Application was submitted in accordance with 310 CMR 7.02 Plan Approval and Emission Limitations as contained in 310 CMR 7.00 "Air Pollution Control," regulations adopted by MassDEP pursuant to the authority granted by Massachusetts General Laws, Chapter 111, Section 142 A-O, Chapter 21C, Section 4 and 6, and Chapter 21E, Section 6. MassDEP's review of your Application has been limited to air pollution control regulation compliance and does not relieve you of the obligation to comply with any other regulatory requirements.

MassDEP has determined that the Application is administratively and technically complete and that the Application is in conformance with the Air Pollution Control regulations and current air pollution control engineering practice, and hereby grants this **Plan Approval** for said Application, as submitted, subject to the conditions listed below.

Please review the entire Plan Approval, as it stipulates the conditions with which the Facility owner/operator ("Permittee") must comply in order for the Facility to be operated in compliance with this Plan Approval.

This information is available in alternate format. Contact Michelle Waters-Ekanem, Director of Diversity/Civil Rights at 617-292-5751.

TTY# MassRelay Service 1-800-439-2370

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1. DESCRIPTION OF FACILITY AND APPLICATION

Lifoam Industries, LLC (the “Permittee”) proposes to manufacture expandable polystyrene (EPS) foam products for various customers such as those engaged in the fishing and food industries. The manufacturing operations at the new Facility will use an EPS bead that contains pentane, a volatile organic compound (VOC). The pentane in the bead will be used as a blowing agent to expand the polystyrene before and during product molding.

The proposed facility will consist of a pre-expander (EU-PREX1), aging and re-grind bags located in a new aging room (EU-AR1), and up to fourteen EPS molding machines (EU-MLD1, EU-MLD2, EU-MLD3, EU-MLD4, EU-MLD5, EU-MLD6, EU-MLD7, EU-MLD8, EU-MLD9, EU-MLD10, EU-MLD11, EU-MLD12, EU-MLD13, EU-MLD14).

The facility will also include a new Cleaver-Brooks process steam boiler (EU-CBB1), a Cleaver-Brooks secondary process steam boiler (EU-CBB2), and an emergency generator (EU-EG). None of the combustion equipment is subject to plan approval since they either fall below MassDEP’s Air Quality permitting thresholds or will be certified via the Environmental Results Program (ERP); however, the potential emissions from this equipment will be incorporated into the facility’s potential emission limits found in Table 2 below.

Process steam will be provided to the pre-expander and the EPS molding machines (e.g., manufacturing operations) by EU-CBB1 and EU-CBB2. EU-CBB2 will also provide supplemental process steam for the manufacturing operations whenever needed. These boilers will utilize natural gas as their sole fuel source.

The manufacturing process will begin with receiving the EPS beads, typically in 2,200 pound totes. The beads will be manually transferred to a holding tank or “bead bin”. The beads will then be pneumatically transferred to the pre-expander where the raw beads will be heated with direct contact steam and expanded to 30 to 40 times their original size. The expanded beads then will be pneumatically transferred to one of up to twenty five (25) storage bags located in EU-AR1, where they will be aged for a period of 6 to 48 hours (“pre-puff stage”).

As the EPS beads are transferred from EU-PREX1 to EU-AR1, they passively cool to approximately ambient temperature. The aging bags will allow air to enter the bead cells and equilibrate between the top and a small vent on the bottom so that air can pass over the beads, but may be replaced with open mesh aging bags to allow for free flow of pentane out of the silos (bags) into the permanent total enclosure (PTE) space of EU-AR1. Pentane released from the aging bags account for approximately 20% of the total incoming pentane, based on a compliance test performed from October 20 - 22, 2015 at Lifoam’s former manufacturing location. Since pentane is approximately 2.5 times heavier than air, pentane released from the EPS beads during the bead aging process sinks to the bottom of the aging

rooms/bags. Captured pentane emissions from EU-PREX1 and EU-AR1 are conveyed by centrifugal blowers to a regenerative thermal oxidizer (RTO), specifically to a Ship and Shore Model No. SSE-98X-7.5K RTO (PCD-RTO) for control.

After aging in the bead storage bags, the beads are pneumatically transferred to enclosed hoppers, which are attached to the molding machines. The beads are then transferred into the mold where steam is added to form the molded products. The molding machines have been modified so that they exhaust to a vacuum capture system during molding. The steam/air mixture is drawn off the molds, and passed through an air/water separator. The steam condenses to water, leaving the press through a drain line and gravity fed to the cooling water system reservoir. Water from the cooling water system is pumped back to the molding machines where it is used for cooling the parts after they are molded as well as for condensing exhaust steam and cooling hydraulics and equipment.

During the molding process, the EPS material is enclosed within the press. The Permittee estimates that 95 percent, by weight (based on emissions testing and mass balance measurements), of the process pentane emissions from the pre-expander, the aging room, and the fourteen molding machines will be captured and sent PCD-RTO for control.

The molded EPS products are then stored within the facility's warehouse prior to shipment to the customer. Approximately half of the VOC emissions released from the stored product occur during the first four weeks of storage. Assuming if all of the residual pentane in the life of the finished EPS product was to be emitted, this amount would equate to up to 28.2 tons per year (TPY) of VOC emissions based on the maximum consumption of 5,130,000 pounds per year of raw EPS beads with a rolling twelve month average pentane content of 5.5 percent by weight. This is a conservative estimate of these fugitive pentane emissions since there still is a significant amount remaining pentane in the shipped product.

Two new centrifugal blowers with a combined rated capacity of at least 7,500 standard cubic feet per minute (scfm) will collect VOC laden gases from the collection header which will maintain a negative pressure in the emission unit capture headers serving each of the following emission units: EU-PREX1, EU-AR1, and EU-MLD1 through EU-MLD14. PCD-RTO will have a rated air flow capacity of at least 7,500 scfm. PCD-RTO will be equipped with a burner which will burn natural gas as the only fuel of use at a designed energy input capacity of at least 3.1 million British thermal units per hour (MMBtu/hr).

Under normal operating conditions, the set point of PCD-RTO operating temperature will be approximately 1515 degrees Fahrenheit ($^{\circ}\text{F}$), in order to maintain the minimum operating temperature of 1,500 $^{\circ}\text{F}$, or such other temperature as may be established pursuant to satisfactory compliance testing results as determined by MassDEP. The effective volume of each combustion chamber within PCD-RTO is approximately 508 cubic feet which is designed to provide a minimum retention time of greater than 0.5 second at an operating temperature of 1,500 $^{\circ}\text{F}$. Thermocouples will be located within each of the two combustion

chambers. A temperature chart recorder and a data logger will continuously monitor and record the actual operating temperature of PCD-RTO as one (1) minute averages.

PCD-RTO's VOC destruction efficiency will be 99 percent of the process air captured or a maximum outlet VOC emission rate of 0.30 pounds per hour, whichever is less stringent. This will be demonstrated through future compliance testing as specified in Table No. 3, Paragraph No. 7. In the event of an emergency shutdown of PCD-RTO, the molding machines will stop production and the process air in the aging room will be re-circulated until such time that PCD-RTO is operating properly again.

During nonproduction periods such as weekends when PCD-RTO and EPS bead processes are not in operation or whenever PCD-RTO is down for maintenance, pentane emissions will be re-circulated within EU-AR1 until bead processing resumes. Each aging room is equipped with Lower Explosive Level (LEL) monitors with an emergency set point of up to 25 percent of the LEL or 3,750 parts per million (ppm) pentane, and two TRI Model CV9-36 axial fan systems for emergency ventilation. Should this upset condition take place, an audible alarm shall sound and notify Lifoam personnel via electronic notification. In addition, a data logger shall automatically record the date, time, and the length of time the emergency system had been activated.

The Permittee also will be installing and operating up to four (4) American World Trade Group AWT Cameo 18-CB screen printing machines, or equivalent, to apply printing to some molded EPS products. These four screen printing machines will generate less than 0.3 ton per year of VOC emissions.

The Permittee has indicated that the Project may be subject to the Federal New Source Performance Standards (NSPS) for Small Industrial-Commercial-Institutional Steam Generating Units (40 CFR Part 60 Subpart Dc).

The Permittee has indicated that the Project may be subject to 40 CFR Part 63, Subpart ZZZZ, National Emission Standards for Hazardous Air Pollutants (NESHAPs) for Stationary Reciprocating Internal Combustion Engines. Since the Permittee's Facility is an area source for HAPs and is defined as an institution, compliance with 40 CFR Part 63, Subpart ZZZZ shall be met by complying with the requirements of 40 CFR Part 60, Subpart JJJJ, "Standards of Performance for Stationary Spark Ignition Internal Combustion Engines".

MassDEP is not the delegated authority for these federal regulations since this facility will be a non-major Air Quality source and not subject to MassDEP's Operating Permit Program.

2. EMISSION UNIT (EU) IDENTIFICATION

Each Emission Unit (EU) identified in Table 1 is subject to and regulated by this Plan Approval:

Table 1				
EU#	Description	Maximum Design Capacity	Pollution Control Device (PCD)	
EU-PREX1	Hirsch Model No. PREEX6000XXL new pre-expander, or equivalent	1,097 lbs/hr	Ship and Shore Model No. SSE-98X-7.5K RTO (PCD-RTO)	
EU-AR1	Aging room with aging bags and re-grind bags	649 lbs/hr		
EU-MLD1 EU-MLD2 EU-MLD3 EU-MLD4 EU-MLD5 EU-MLD6 EU-MLD7 EU-MLD8 EU-MLD9 EU-MLD10 EU-MLD11 EU-MLD12 EU-MLD13 EU-MLD14	14 new Hirsch Model No. HS1400 molding machines, or equivalent	43 lbs/hr per molding machine		
EU-SP1 EU-SP2 EU-SP3 EU-SP4	4 American World Trade Group AWT Cameo 18-CB screen printing machines, or equivalent	N/A		None
EU-CBB1	Cleaver-Brooks Model No. CBLE700-400-150 boiler, or equivalent	16.75 MMBtu/hr		None
EU-CBB2	Cleaver-Brooks Model No. CB40-300 boiler, or equivalent	8.375 MMBtu/hr		
EU-EG	Existing Kohler Model No. 20RESA emergency generator	50 kW output		

Table 1 Key:

RTO = regenerative thermal oxidizer
EU# = Emission Unit Number
PCD = Pollution Control Device
lbs/hr = pounds per hour
MMBtu/hr = million British thermal units per hour
N/A = not applicable
No. = number
kW = kilowatt

3. APPLICABLE REQUIREMENTS

A. OPERATIONAL, PRODUCTION and EMISSION LIMITS

The Permittee is subject to, and shall not exceed the Operational, Production, and Emission Limits as contained in Table 2 below:

Table 2			
EU#	Operational / Production Limit	Air Contaminant	Emission Limit
EU-PREX1 EU-AR1 EU-MLD1 EU-MLD2 EU-MLD3 EU-MLD4 EU-MLD5 EU-MLD6 EU-MLD9 EU-MLD10 EU-MLD11 EU-MLD7 EU-MLD8 EU-MLD12 EU-MLD13 EU-MLD14	<p><u>Maximum</u> pentane content of EPS beads shall not exceed 5.7 percent by weight.</p> <p>Twelve month rolling <u>average</u> pentane content of EPS beads shall not exceed 5.5 percent by weight.</p> <p>Maximum throughput of EPS beads shall not exceed:</p> <ul style="list-style-type: none"> 1,068,750 pounds of pentane beads per month and 5,130,000 pounds of pentane beads over any consecutive twelve month rolling period. <p>Air handling systems shall provide a capture efficiency $\geq 95\%$</p>	VOC	Minimum VOC destruction efficiency of 99 percent by weight or a maximum outlet VOC emission rate of 0.30 pounds per hour, whichever is less stringent

Table 2			
EU#	Operational / Production Limit	Air Contaminant	Emission Limit
EU-SP1 EU-SP2 EU-SP3 EU-SP4	N/A	VOC	0.06 TPM; 0.27 TPY
EU-CBB1 ^a	Natural gas is sole fuel of use.	NO _x	0.22 TPM; 2.57 TPY
		CO	0.49 TPM; 5.87 TPY
		VOC	0.19 TPM; 2.20 TPY
		PM/PM ₁₀ /PM _{2.5}	0.06 TPM; 0.73 TPY
		Opacity	<5%, except 5 to <10% for ≤2 minutes during any one hour
EU-CBB2	Natural gas is sole fuel of use.	NO _x	0.11 TPM; 1.28 TPY
		CO	0.25 TPM; 2.93 TPY
		VOC	0.10 TPM; 1.10 TPY
		PM/PM ₁₀ /PM _{2.5}	0.03 TPM; 0.37 TPY
		Opacity	<5%, except 5 to <10% for ≤2 minutes during any one hour
EU-EG	Natural gas is sole fuel of use.	NO _x	0.10 TPM; 0.20 TPY
		CO	0.16 TPM; 0.32 TPY
		VOC	0.005 TPM; 0.01 TPY
		PM/PM ₁₀ /PM _{2.5}	0.005 TPM; 0.01 TPY
		Opacity	<5%, except 5 to <10% for ≤2 minutes during any one hour
Facility-wide	N/A	NO _x	0.43 TPM; 5.0 TPY
		CO	0.9 TPM; 11.2 TPY
		VOC	7.5 TPM; 47.1 TPY
		PM/PM ₁₀ /PM _{2.5}	0.2 TPM; 1.2 TPY
		SO ₂	0.05TPM; 0.1 TPY
		Total HAPs	0.4 TPM; 3.0 TPY

Table 2 Key:

N/A = Not Applicable
EU# = Emission Unit Number
EPS = Expandable Polystyrene
NO_x = Nitrogen Oxides
CO = Carbon Monoxide
SO₂ = Sulfur Dioxide
PM = Total Particulate Matter

PM₁₀ = Particulate Matter less than or equal to 10 microns in diameter
PM_{2.5} = Particulate Matter less than or equal to 2.5 microns in diameter
VOC = Volatile Organic Compounds
Total HAPs = total Hazardous Air Pollutants.
TPM = tons per month
TPY = tons per consecutive 12-month period
< = less than
≤ = less than or equal to
≥ = greater than or equal to
% = percent

Table 2 Note:

^a = emission limits are established at 310 CMR 7.26(30) for these emission units

B. COMPLIANCE DEMONSTRATION

The Permittee is subject to, and shall comply with, the monitoring, testing, record keeping, and reporting requirements as contained in Tables 3, 4, and 5 below:

Table 3	
EU#	Monitoring and Testing Requirements
EU-PREX1 EU-AR1 EU-MLD1 EU-MLD2 EU-MLD3 EU-MLD4 EU-MLD5 EU-MLD6 EU-MLD7 EU-MLD8 EU-MLD9 EU-MLD10 EU-MLD11 EU-MLD12 EU-MLD13 EU-MLD14	1. The Permittee shall conduct compliance testing for VOC on these EUs within one hundred twenty (120) days of the commencement of continuous operation of said EUs. All compliance testing shall be conducted in accordance with the test methods and procedures set forth in 40 CFR 60, Appendix A. All compliance testing shall be witnessed by MassDEP personnel at a mutually agreeable date and time.
	2. The Permittee shall monitor the weekly, calendar month, and twelve month rolling consumption of EPS beads processed by the facility in these EUs to document compliance status with the limitations contained in Table 2 above. The average monthly pentane content of the EPS beads consumed and the total monthly EPS bead consumption shall be used to determine the actual monthly emission rates.
	3. Within thirty (30) days of the continuous operation of the PCD-RTO, the Permittee shall balance the air handling system and measure the air flow within the air handling system to ensure that all VOC-laden process air is vented to the PCD-RTO. Permittee shall allow MassDEP personnel to witness the documentation of the capture effectiveness of the air handling system.
	4. For compliance testing purposes, the PCD-RTO and its associated pentane capture system shall be constructed so as to accommodate the emissions testing requirements as stipulated in 40 CFR Part 60, Appendix A. The two (2) inlet and two (2) outlet sampling ports should ideally be located at two duct diameters upstream and eight duct diameters downstream of any flow disturbance. The corresponding sampling ports should be 90 degrees apart from each other.

Table 3	
EU#	Monitoring and Testing Requirements
EU-PREX1 EU-AR1 EU-MLD1 EU-MLD2 EU-MLD3 EU-MLD4 EU-MLD5 EU-MLD6 EU-MLD7 EU-MLD8 EU-MLD9 EU-MLD10 EU-MLD11 EU-MLD12 EU-MLD13 EU-MLD14	5. The Permittee shall monitor operations so that a minimum PCD-RTO combustion chamber temperature of 1,500 degrees Fahrenheit, or other such temperature as may be established pursuant to satisfactory compliance testing results as determined by MassDEP, is achieved prior to ducting of VOC laden air to PCD-RTO, or introduction of pentane beads to any pre-expander or molding machine. This minimum temperature shall be maintained at all times (in one-minute averages) while any associated emission unit(s) is/are producing VOC laden air that can't be re-circulated. Temperature monitoring shall include date and time and any necessary description of operational changes that may occur.
	6. The Permittee shall monitor operations so that in the event of a PCD-RTO malfunction, an interlock system shall be installed and maintained to prevent the uncontrolled operation of EU-PREX1 and EU-MLD1 through EU-MLD14. The Permittee shall cease feeding EPS beads to these emission units until PCD-RTO is operating properly, and consistent with the requirements of the plan approval.
	7. Compliance testing shall be conducted on PCD-RTO and the associated PTEs every three (3) years, or as determined by MassDEP, with the first compliance test commencing within one hundred twenty days (120 days) of commencement of continuous operation of PCD-RTO. The compliance testing of PCD-RTO must demonstrate, at minimum, that: a) each applicable enclosure complies with the United States Environmental Protection Agency's (USEPA) Method 204 which outlines criteria for Permanent Total Enclosures; b) the actual pentane capture system complies with the required overall, minimum VOC capture efficiency of 95% (by mass balance justification); and c) the VOC destruction efficiency of PCD-RTO is a minimum of 99.0 percent by weight or a maximum outlet VOC emission rate of 0.30 pound per hour or less, whichever is less stringent. The compliance testing procedures must follow USEPA and MassDEP methods and guidelines.
	8. The Permittee shall monitor maintenance activities associated with PCD-RTO.
EU-SP1 EU-SP2 EU-SP3 EU-SP4	9. The Permittee shall monitor the monthly and twelve month rolling consumption of VOC containing materials for these EUs to document compliance status with the limitations contained in Table 2 above.
EU-CBB1 EU-CBB2 EU-EG	10. The Permittee shall monitor the monthly and twelve month rolling consumption of natural gas to document compliance status with the emission limitations contained in Table 2 above.
Facility-wide	11. The Permittee shall monitor to ensure that all VOC or HAPs-containing materials such as coatings, solvents, and cleanup solutions, shall be transported and stored in tightly covered containers.
	12. The Permittee shall monitor that all cleaning rags used in conjunction with the VOC containing cleaning solutions shall be placed in tightly covered containers when not in use, and shall be collected for proper recycling or disposal.
	13. The Permittee shall monitor Facility operations so that deviations from Plan Approval requirements can be reported to MassDEP.

Table 3	
EU#	Monitoring and Testing Requirements
Facility-wide	14. The Permittee shall monitor raw material usage each month in order to determine the actual emissions of VOC and HAPs for the month as well as for the prior 11 months for the entire Facility.
	15. The Permittee shall monitor Facility operations such that emissions may be calculated as required for compliance with 310 CMR 7.12.

Table 3 Key:

EU# = Emission Unit Number

PCD-RTO = Pollution Control Device – Regenerative Thermal Oxidizer

VOC = volatile organic compounds

PTE = Permanent Total Enclosure

HAPs = hazardous air pollutants

% = percent

CFR = Code of Federal Regulations

EPS = Expandable Polystyrene

Table 4	
EU#	Record Keeping Requirements
EU-PREX1 EU-AR1 EU-MLD1 EU-MLD2 EU-MLD3 EU-MLD4 EU-MLD5 EU-MLD6 EU-MLD7 EU-MLD8 EU-MLD9 EU-MLD10 EU-MLD11 EU-MLD12 EU-MLD13 EU-MLD14	1. The Permittee shall quantify all periods of excess emissions, even if attributable to an emergency/malfunction, startup/shutdown or equipment cleaning in the determination of annual emissions and compliance with the emission limits as stated in Table 2.

Table 4

EU#	Record Keeping Requirements
EU-PREX1 EU-AR1 EU-MLD1 EU-MLD2 EU-MLD3 EU-MLD4 EU-MLD5 EU-MLD6 EU-MLD7 EU-MLD8 EU-MLD9 EU-MLD10 EU-MLD11 EU-MLD12 EU-MLD13 EU-MLD14	<p>2. The Permittee shall maintain a record keeping system for these EUs to be established on-site. All such records shall be maintained up-to-date such that year-to-date information is readily available for MassDEP examination upon request and shall be kept on site for a minimum of five (5) years. Record keeping shall, at a minimum, include:</p> <p>a) Compliance records sufficient to document the actual monthly and twelve month rolling emission rates of VOC from these EUs, so as to determine compliance status with the emission limitations contained in Table 2 above. Such records shall include, but are not limited to, the daily, monthly, and twelve month rolling emission rates, emissions test results, monitoring equipment data and reports, and hours of operation.</p> <p>b) Maintenance: A record of routine maintenance activities performed on these EUs and their monitoring equipment including, at a minimum, the type or a description of the maintenance performed and the date and time the work was completed.</p> <p>c) Malfunctions: A record of all malfunctions of these EUs and their monitoring equipment including, at a minimum: the date and time the malfunction occurred; a description of the malfunction and the corrective action taken; the date and time corrective actions were initiated; and the date and time corrective actions were completed and the equipment was returned to compliance.</p>
	<p>3. The Permittee shall maintain records on-site of the weekly, calendar month, and twelve month rolling EPS bead consumption to document compliance status with the emission limitations contained in Table 2 above.</p>
	<p>4. The Permittee shall maintain records documenting actual PCD-RTO combustion chamber temperature in degrees Fahrenheit. Temperature monitoring shall include the date and any necessary description of operational changes that may occur. The combustion chamber temperature of the PCD-RTO shall be recorded with temperature monitoring and recording equipment using a digital readout and stored on a computerized hard drive, flash card, disc, or other media. Permittee shall have on-site a temperature data back up to the flash card, disc, or other backup data capture media. These records shall be maintained on-site, and shall be made available to MassDEP personnel upon request.</p>
	<p>5. The Permittee shall maintain records of all malfunctions as defined in the SOMP as well as historical activation of the interlock system associated with PCD-RTO, including corrective actions taken and steps to prevent similar malfunctions from reoccurring in the future.</p>
	<p>6. The Permittee shall maintain records of all emission testing for PCD-RTO.</p>
	<p>7. The Permittee shall maintain a maintenance log for PCD-RTO which shall record all routine and emergency maintenance work and repairs performed on it, as specified in the SOMP. Said log shall indicate all malfunctions and down time.</p>
	<p>8. The Permittee shall maintain all records of PCD-RTO operation/malfunction resulting in any associated uncontrolled excess VOC emissions.</p>

Table 4	
EU#	Record Keeping Requirements
EU-SP1 EU-SP2 EU-SP3 EU-SP4	9. The Permittee shall quantify all periods of excess emissions, even if attributable to an emergency/malfunction, startup/shutdown or equipment cleaning in the determination of annual emissions and compliance with the emission limits as stated in Table 2.
	10. The Permittee shall maintain records on-site of the monthly and twelve month rolling VOC emissions to document compliance status with the emission limitations contained in Table 2 above.
EU-CBB1 EU-CBB2 EU-EG	11. The Permittee shall maintain records of monthly and twelve month rolling natural gas consumption rates and the corresponding actual emissions from these emission units.
Facility-wide	12. The Permittee shall maintain adequate records on-site to demonstrate compliance status with all operational, production, and emission limits contained in Table 2 above. Records shall also include the actual emissions of air contaminant(s) emitted for each calendar month and for each consecutive twelve month period (current month plus prior eleven months). These records shall be compiled no later than the 15 th day following each month. An electronic version of the MassDEP approved record keeping form, in Microsoft Excel format, can be downloaded at http://www.mass.gov/eea/agencies/massdep/air/approvals/limited-emissions-record-keeping-and-reporting.html .
	13. The Permittee shall maintain records of monitoring and testing as required by Table 3.
	14. In accordance with 310 CMR 7.71(6)b. and c. retain at the facility for five years and make available to the Department upon request copies of the documentation of the methodology and data used to quantify greenhouse gas emissions.
	15. The Permittee shall maintain a copy of this Plan Approval, underlying Application and the most up-to-date SOMP for the EUs and PCDs approved herein on-site.
	16. The Permittee shall maintain a record of routine maintenance activities performed on the approved EU(s), PCD, and monitoring equipment. The records shall include, at a minimum, the type or a description of the maintenance performed and the date and time the work was completed.
	17. The Permittee shall maintain a record of all malfunctions affecting air contaminant emission rates on the approved EU(s), PCD, and monitoring equipment. At a minimum, the records shall include: date and time the malfunction occurred; description of the malfunction; corrective actions taken; the date and time corrective actions were initiated and completed; and the date and time emission rates and monitoring equipment returned to compliant operation.
	18. The Permittee shall maintain records of facility operations such that information may be reported as required for compliance with 310 CMR 7.12.
	19. The Permittee shall maintain records required by this Plan Approval on-site for a minimum of five (5) years.

Table 4	
EU#	Record Keeping Requirements
Facility-wide	20. The Permittee shall make records required by this Plan Approval available to MassDEP and USEPA personnel upon request.

Table 4 Key:

EU# = Emission Unit Number

PCD = Pollution Control Device

EPS = Expandable Polystyrene

PCD-RTO = Pollution Control Device – Regenerative Thermal Oxidizer

VOC = volatile organic compounds

SOMP = Standard Operating and Maintenance Procedures

USEPA = United States Environmental Protection Agency

CMR = Code of Massachusetts Regulations

Table 5	
EU#	Reporting Requirements
EU-PREX1 EU-AR1 EU-MLD1 EU-MLD2 EU-MLD3 EU-MLD4 EU-MLD5 EU-MLD6 EU-MLD7 EU-MLD8 EU-MLD9 EU-MLD10 EU-MLD11 EU-MLD12 EU-MLD13 EU-MLD14	1. The Permittee shall submit a compliance test protocol on the required initial compliance test to MassDEP's Northeast Regional Office (NERO), Bureau of Air and Waste (BAW) Permit Chief, for review and approval at least sixty (60) days prior to the scheduled commencement of said testing. Test protocols for any subsequent required emissions testing shall be submitted for review and approval at least forty-five (45) days prior to the scheduled commencement of said testing.
	2. The Permittee shall submit the initial emission test results report to this Office, attention BAW Permit Chief, for review within sixty (60) days of the completion of any required compliance stack testing.
	3. In the event of any PCD-RTO malfunction which results in any uncontrolled excess VOC emissions, the Permittee shall notify MassDEP by telephone within three (3) business day and subsequently in writing within ten (10) days of said occurrence. This written notification shall describe the reason(s) for and the extent of down time of the equipment and all steps that have been or will be taken to prevent similar malfunctions from occurring in the future.
	4. The Permittee shall notify NERO, in writing, within fourteen (14) days of commencement of operation of these EUs. These EUs shall not be operated without control by PCD-RTO.
	5. The Permittee shall submit the Final Standard Operating and Maintenance Procedures (SOMP) for these EUs and PCD-RTO to NERO within sixty (60) days of completion of their required initial compliance testing. Any subsequent changes to the SOMP shall be submitted within fifteen (15) days of said revision(s).

Table 5	
EU#	Reporting Requirements
Facility-wide	6. The Permittee shall notify MassDEP's NERO by telephone, fax, or email as soon as possible, but in any case no later than three (3) business days, and subsequently in writing within ten (10) business days, after the occurrence of any upsets or malfunctions to these EUs and related equipment which results in an excess emission to the air and/or a condition of air pollution.
	7. All notifications and reporting required and not specified by this Approval shall be made to: BAW Permit Chief MassDEP - NERO 205B Lowell Street Wilmington, Massachusetts 01887 Phone: 978-694-3200 Fax: 978-694-3499
	8. A semi-annual report of the VOC and HAPs emissions data for the period of January 1 through June 30 inclusive and for the period of July 1 through December 31 inclusive must be submitted to the MassDEP, attention BAW Permit Chief, by no later than the following July 30th and January 30th, respectively.
	9. Accurately report the Facility's air emissions on Source Registration/Emission Statement Forms as required by Regulation 310 CMR 7.12.
	10. The Permittee shall submit to MassDEP all information required by this Plan Approval over the signature of a "Responsible Official" as defined in 310 CMR 7.00 and shall include the Certification statement as provided in 310 CMR 7.01(2)(c).
	11. The Permittee shall notify the Northeast Regional Office of MassDEP, BAW Permit Chief, by telephone (978-694-3200), email, nero.air@state.ma.us, or fax (978-694-3499), as soon as possible, but no later than three (3) business days after discovery of an exceedance(s) of Table 2 requirements. A written report shall be submitted to BAW Permit Chief at MassDEP within ten (10) business days and shall include: identification of exceedance(s), duration of exceedance(s), reason for the exceedance(s), corrective actions taken, and action plan to prevent future exceedance(s).
	12. In accordance with 310 CMR 7.71(5), by April 15 th of each year report emissions of greenhouse gases from stationary emissions sources including, but not limited to, emissions from factory stacks, manufacturing processes and vents, fugitive emissions, and other process emissions; and owned or leased motor vehicles when stationary source greenhouse gas emissions are greater than 5,000 short ton CO ₂ e. Report greenhouse gas emissions electronically in a format that can be accommodated by the registry.
	13. In accordance with 310 CMR 7.71(6), certify greenhouse gas emissions reports using a form provided by the Department or the registry.

Table 5	
EU#	Reporting Requirements
Facility-wide	14. In accordance with 310 CMR 7.71(7), by December 31 st of the applicable year submit to the Department documentation of triennial verification of the greenhouse gas emissions reports.

Table 5 Key:

EU# = Emission Unit Number

BAW = Bureau of Air and Waste

VOC = volatile organic compounds

HAPs = hazardous air pollutants

CO₂e = carbon dioxide equivalents

PCD-RTO = Pollution Control Device – Regenerative Thermal Oxidizer

CMR = Code of Massachusetts Regulations

4. SPECIAL TERMS AND CONDITIONS

The Permittee is subject to, and shall comply with, the following special terms and conditions:

- A. The Permittee shall comply with the Special Terms and Conditions as contained in Table 6 below:

Table 6	
EU#	Special Terms and Conditions
EU-PREX1 EU-AR1	<p>1. The Permittee shall establish and maintain documentation and adhere to the criteria for VOC capture efficiency - U.S. EPA Method 204 for permanent total enclosures (PTEs) for these emission units. The criteria for a PTE are the following:</p> <ul style="list-style-type: none"> a) All access doors and windows are closed during normal operation. b) The interior of the PTE is under negative pressure to the outside environment. c) The average velocity through the natural draft openings (NDOs) must be greater than 200 feet per minute. d) Sources of VOC in the PTE must be at least four (4) equivalent diameters from each NDO. e) The total area of all NDOs must be less than five (5) percent of the total area of the enclosure. <p>The above procedures shall be incorporated into Permittee's Standard Operating and Maintenance Procedure (SOMP) for these emission units.</p>

Table 6

EU#	Special Terms and Conditions
EU-PREX1 EU-AR1	<p>2. The Permittee shall establish and maintain a copy of the full PTE site-specific test plan on-site. The test plan should contain the following:</p> <ul style="list-style-type: none"> a) A description of how Permittee will demonstrate that, within the PTE, the VOC concentrations shall be maintained and not rise or exceed safe Occupational Safety & Health Administration (OSHA) levels. Method 204 lists the requirements for such levels; b) A full explanation of any possible natural draft openings (NDOs) and how they might affect the overall certification of the PTE; c) A description of how Permittee will monitor to verify that the PTE will meet either inward flow to the PTE or negative pressure in the PTE; and d) A calculation of the PTE area ratios as required in Method 204. <p>This plan shall be made available to MassDEP personnel upon request.</p>
EU-PREX1 EU-AR1 EU-MLD1 EU-MLD2 EU-MLD3 EU-MLD4 EU-MLD5 EU-MLD6 EU-MLD7 EU-MLD8 EU-MLD9 EU-MLD10 EU-MLD11 EU-MLD12 EU-MLD13 EU-MLD14	<p>3. The Permittee shall maintain documentation of the actual VOC capture efficiency of the pentane capture system based on the most recently performed compliance test.</p> <p>4. The Permittee shall operate the subject EUs consistent with the Final SOMP and the conditions/parameters established from each compliance test.</p> <p>5. PCD-RTO shall provide a minimum control efficiency of 99.0 weight percent for VOC or a maximum outlet VOC emission rate of less than 0.30 pound per hour, whichever is less stringent. All associated permanent total enclosures (PTEs) shall provide 100 percent capture efficiency based on conformance to Method 204.</p> <p>6. There are five (5) upset conditions for which the associated emission units being controlled by PCD-RTO shall immediately be shut down. These conditions are as follows:</p> <ul style="list-style-type: none"> a) RTO fan failure; b) RTO combustion chamber exceeding 1950 °F or manufacturer's specification; c) hydraulic system (i.e. pumps, etc.) pressure loss; d) loss of burner gas pressure, gas service interruption, or flame out; and/or e) general system or PCD-RTO power failure. <p>7. A copy of the Standard Operating and Maintenance Procedure (SOMP) for PCD-RTO shall be located at or nearby the system's control panel.</p> <p>8. The start-up specifications and maintenance procedures for PCD-RTO as well as the emergency shutdown procedures for EUs and PCD-RTO shall be established and incorporated into its SOMP. The SOMP shall address the spare parts inventory and back-up equipment systems for the PCD-RTO to prevent or reduce any downtime PCD-RTO. In addition, a copy of any subsequent revisions made to the SOMP must be submitted to this office within fifteen (15) days of the documented modification(s).</p>

Table 6

EU#	Special Terms and Conditions
EU-PREX1 EU-AR1 EU-MLD1 EU-MLD2 EU-MLD3 EU-MLD4 EU-MLD5 EU-MLD6 EU-MLD7 EU-MLD8 EU-MLD9 EU-MLD10 EU-MLD11 EU-MLD12 EU-MLD13 EU-MLD14	<p>9. An electronic interlock system shall prevent or interrupt the introduction of EPS bead to any emission unit requiring control by PCD-RTO until the PCD-RTO achieves and maintains the minimum operating temperature of 1,500°F (or such other temperature as may be established pursuant to satisfactory compliance testing results as determined by MassDEP). In the event the interlock is activated to prevent processing, all bead processing emission units will be allowed to complete any cycle already in progress prior to interruption from further EPS processing.</p> <p>10. In the event of an emergency shutdown of PCD-RTO, the molding machines shall stop production and the process air in the aging room shall be re-circulated until such time that PCD-RTO is operating properly again.</p>
Facility-wide	<p>11. This Facility may be subject to the Federal New Source Performance Standards (NSPS) for Small Industrial-Commercial-Institutional Steam Generating Units (40 CFR Part 60 Subpart Dc). Since MassDEP has not accepted delegation for Subpart Dc, you are advised to consult with the EPA for additional information. There may be additional notification, record keeping and reporting requirements. Their address is US EPA Region 1, 5 Post Office Square – Suite 100, Boston, MA 02109-3912.</p>
	<p>12. The Permittee shall evaluate the feasibility of capturing and controlling the pentane emissions from both the raw material storage area and the finished product storage area to further minimize VOC emissions. The results of this evaluation shall be completed and submitted by no later than December 31, 2018, to MassDEP for review and approval.</p>
	<p>13. The feasibility study report shall include at a minimum:</p> <ul style="list-style-type: none"> a) the measured pentane concentrations at both areas of the new facility during manufacturing and non-manufacturing operations as well as the aging room (EU-AR1); b) the estimation of additional pentane emissions that could be captured and controlled by the existing PCD-RTO; and c) the reasons why the additional capture and control would be feasible or infeasible.
	<p>14. Should the feasibility study indicate that it would be feasible to capture and control pentane emissions from one or both of the storage areas, then the Permittee shall submit plans, specifications, and a timeline for the installation and operation of the new capture system(s) to MassDEP by no later than January 31, 2019.</p>

Table 6	
EU#	Special Terms and Conditions
Facility-wide	15. This Facility may be subject to subject to 40 CFR Part 63, Subpart ZZZZ, National Emission Standards for Hazardous Air Pollutants (NESHAPs) for Stationary Reciprocating Internal Combustion Engines. Since the Permittee's Facility is an area source for HAPs and is defined as an institution, compliance with 40 CFR Part 63, Subpart ZZZZ shall be met by complying with the requirements of 40 CFR Part 60, Subpart JJJJ, "Standards of Performance for Stationary Spark Ignition Internal Combustion Engines". Since MassDEP has not accepted delegation for area sources, you are advised to consult with the United States Environmental Protection Agency (USEPA) for additional information. There may be additional notification, record keeping and reporting requirements. Their address is US EPA Region 1, 5 Post Office Square – Suite 100, Boston, MA 02109-3912.

Table 6 Key:

EU# = Emission Unit Number

EUs = emission units

EPA = Environmental Protection Agency

VOC= Volatile Organic Compounds

PCD-RTO = Pollution Control Device – Regenerative Thermal Oxidizer

RTO = Regenerative Thermal Oxidizer

EPS = Expandable Polystyrene (Bead)

°F = degrees Fahrenheit

CFR = Code of Federal Regulations

- B. The Permittee shall install and use an exhaust stack, as required in Table 7, on each of the Emission Units that is consistent with good air pollution control engineering practice and that discharges so as to not cause or contribute to a condition of air pollution. Each exhaust stack shall be configured to discharge the gases vertically and shall not be equipped with any part or device that restricts the vertical exhaust flow of the emitted gases, including but not limited to rain protection devices known as "shanty caps" and "egg beaters." The Permittee shall install and utilize exhaust stacks with the following parameters, as contained in Table 7 below, for the Emission Units that are regulated by this Plan Approval:

Table 7				
EU#/PCD	Stack Height Above Ground (feet)	Stack Inside Exit Dimensions (feet)	Minimum Stack Gas Exit Velocity (feet per second)	Stack Gas Exit Temperature (°F)
EU-CBB1	35	2.0	27	360
EU-CBB2	35	1.67	19	360
PCD-RTO	35	2.2 x 4.6	18	360
EU-EG	19	0.25	443	1200

Table 7 Key:

EU# = Emission Unit Number

°F = degrees Fahrenheit

PCD = Pollution Control Device

PCD-RTO = Pollution Control Device – Regenerative Thermal Oxidizer

5. GENERAL CONDITIONS

The Permittee is subject to, and shall comply with, the following general conditions:

- A. Pursuant to 310 CMR 7.01, 7.02, 7.09 and 7.10, should any nuisance condition(s), including but not limited to smoke, dust, odor or noise, occur as the result of the operation of the Facility, then the Permittee shall immediately take appropriate steps including shutdown, if necessary, to abate said nuisance condition(s).
- B. If asbestos remediation/removal will occur as a result of the approved construction, reconstruction, or alteration of this Facility, the Permittee shall ensure that all removal/remediation of asbestos shall be done in accordance with 310 CMR 7.15 in its entirety and 310 CMR 4.00.
- C. If construction or demolition of an industrial, commercial or institutional building will occur as a result of the approved construction, reconstruction, or alteration of this Facility, the Permittee shall ensure that said construction or demolition shall be done in accordance with 310 CMR 7.09(2) and 310 CMR 4.00.
- D. Pursuant to 310 CMR 7.01(2)(b) and 7.02(7)(b), the Permittee shall allow MassDEP and / or USEPA personnel access to the Facility, buildings, and all pertinent records for the purpose of making inspections and surveys, collecting samples, obtaining data, and reviewing records.
- E. This Plan Approval does not negate the responsibility of the Permittee to comply with any other applicable Federal, State, or local regulations now or in the future.
- F. Should there be any differences between the Application and this Plan Approval, the Plan Approval shall govern.
- G. Pursuant to 310 CMR 7.02(3)(k), MassDEP may revoke this Plan Approval if the construction work is not commenced within two years from the date of issuance of this Plan Approval, or if the construction work is suspended for one year or more.
- H. This Plan Approval may be suspended, modified, or revoked by MassDEP if MassDEP determines that any condition or part of this Plan Approval is being violated.

- I. This Plan Approval may be modified or amended when in the opinion of MassDEP such is necessary or appropriate to clarify the Plan Approval conditions or after consideration of a written request by the Permittee to amend the Plan Approval conditions.
- J. Pursuant to 310 CMR 7.01(3) and 7.02(3)(f), the Permittee shall comply with all conditions contained in this Plan Approval. Should there be any differences between provisions contained in the General Conditions and provisions contained elsewhere in the Plan Approval, the latter shall govern.

6. MASSACHUSETTS ENVIRONMENTAL POLICY ACT

MassDEP has determined that the filing of an Environmental Notification Form (ENF) with the Secretary of Energy & Environmental Affairs, for air quality control purposes, was not required prior to this action by MassDEP. Notwithstanding this determination, the Massachusetts Environmental Policy Act (MEPA) and 301 CMR 11.00, Section 11.04, provide certain “Fail-Safe Provisions,” which allow the Secretary to require the filing of an ENF and/or an Environmental Impact Report (EIR) at a later time.

7. APPEAL PROCESS

This Plan Approval is an action of MassDEP. If you are aggrieved by this action, you may request an adjudicatory hearing. A request for a hearing must be made in writing and postmarked within twenty-one (21) days of the date of issuance of this Plan Approval.

Under 310 CMR 1.01(6)(b), the request must state clearly and concisely the facts, which are the grounds for the request, and the relief sought. Additionally, the request must state why the Plan Approval is not consistent with applicable laws and regulations.

The hearing request along with a valid check payable to the Commonwealth of Massachusetts in the amount of one hundred dollars (\$100.00) must be mailed to:

Commonwealth of Massachusetts
Department of Environmental Protection
P.O. Box 4062
Boston, MA 02211

This request will be dismissed if the filing fee is not paid, unless the appellant is exempt or granted a waiver as described below. The filing fee is not required if the appellant is a city or town (or municipal agency), county, or district of the Commonwealth of Massachusetts, or a municipal housing authority.

MassDEP may waive the adjudicatory hearing-filing fee for a person who shows that paying the fee will create an undue financial hardship. A person seeking a waiver must file, together with the hearing request as provided above, an affidavit setting forth the facts believed to support the claim of undue financial hardship.

Should you have any questions concerning this Plan Approval, please contact Mr. Mun Wong by telephone at 978-694-3286, or in writing at the letterhead address.

Sincerely,

This final document copy is being provided to you electronically by the
Department of Environmental Protection. A signed copy of this document
is on file at the DEP office listed on the letterhead.

Edward J. Braczyk
Acting Permit Chief
Bureau of Air and Waste

This final document copy is being provided to you electronically by the
Department of Environmental Protection. A signed copy of this document
is on file at the DEP office listed on the letterhead.

Mun S. Wong
Environmental Engineer

cc: Board of Health, 120 Main Street, North Andover, MA 01845
Fire Headquarters, 795 Chickering Road, North Andover, MA 01845
DEP, Boston, Yi Tian (e-copy)
DEP, NERO, Attn: E. Braczyk, M. Bolis, M. Persky
Environmental Resources Management, One Beacon Street, Boston, MA 02108
ATTN: Mr. Bob Fraser

Susan Ruch, Deputy Regional Director, MassDEP NERO/BAW
Email: susan.ruch@state.ma.us